

NON-PUBLIC?: N
ACCESSION #: 9504120117
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Point Beach Nuclear Plant, Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000301

TITLE: Reactor Trip Due to Turbine Generator EH Control System
Oil Leak
EVENT DATE: 03/07/95 LER #: 95-003-00 REPORT DATE: 04/05/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 98

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 2159 on March 7, 1995, Point Beach Nuclear Plant (PBNP) Unit 2 experienced an automatic turbine runback and subsequent reactor trip from 98% power. The turbine runback and reactor trip resulted from an oil leak and subsequent pressure loss in the Unit 2 turbine generator electrohydraulic (EH) control system. The pressure loss caused one of the two turbine stop valves to shut, which led to an overtemperature differential temperature (OT symbol omitted! T) turbine runback and reactor trip. The leak originated from a union joint in the EH oil piping supplying the left turbine stop valve. All reactor protection features operated as designed. The response of the secondary plant is being evaluated. The exact cause of the leaking union joint could not be determined. However, this is considered an isolated event. A 4-hour Emergency Notification System (ENS) notification was made in accordance with 10 CFR 50.72(b)(2)(ii). The NRC Resident Inspector was also

notified.

END OF ABSTRACT

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EVENT DESCRIPTION

At 2150 on March 7, 1995, Point Beach Nuclear Plant (PBNP) Unit 2 was operating at 98% power. As the Duty Operating Supervisor (DOS) walked past the Unit 2 high pressure turbine enclosure on his way from the operations office to the control room, he noticed a pool of oil originating from inside the enclosure. upon opening the door to the enclosure, the DOS observed electrohydraulic (EH) control system oil leaking at approximately 1 gpm from a union joint in the left turbine stop valve return line. The DOS immediately notified the Duty Shift Superintendent (DSS) who requested assistance at the Unit 2 turbine.

In an effort to stop the leak and maintain pressure in the EH system, shift operating personnel obtained extra EH oil to maintain adequate level in the EH fluid reservoir. In addition, they attempted to tighten the leaking union joint. As the union was tightened, however, the internal teflon seal failed and the leakage increased. This caused EH oil pressure on the hydraulic actuator for the left stop valve to drop, causing the stop valve to shut. The reduced steam flow caused reactor coolant system temperature to increase, resulting in an OT symbol omitted! T turbine runback, which was immediately followed by an automatic OT symbol omitted! T reactor trip at 2159 hours.

The IEEE Standard 803A-1983 system identifier for the EH control system is:

Main Turbine Control Fluid System TG

SYSTEM DESCRIPTION

Steam admitted to the turbine generator is controlled by two stop valves (left and right) and four governor valves operated by high pressure hydraulic fluid from the EH control system. A loss of EH oil pressure will cause the hydraulic fluid beneath the turbine stop valves' and governor valves' operating pistons to drain. As the fluid drains, the governor and stop valves will shut and secure steam to the turbine.

The purpose of the OT symbol omitted! T reactor trip is to protect the core against departure from nucleate boiling (DNB). The OT symbol omitted! T reactor protection feature compares hot and cold leg temperatures (symbol omitted! T) to an overtemperature symbol omitted! T setpoint derived from average temperature, pressure, and core

differential neutron flux (symbol omitted! I, difference between upper and lower core flux level). When steam flow is reduced, cold leg temperature increases, average temperature increases, and after a slight time lag, core symbol omitted! T begins to decrease. As average temperature increases, the OT symbol omitted! T trip and turbine runback setpoints are automatically reduced. If the average temperature increase is of sufficient magnitude, the slowly decreasing

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core symbol omitted! T will exceed the more rapidly decreasing OT symbol omitted! T turbine runback setpoint, and a turbine runback is initiated. The turbine runback reduces turbine power, resulting in a further increase in average temperature. The increase in average temperature due to reduction in steam flow will also cause control rod insertion, which then reduces reactor power and average temperature. The lower reactor power results in a lower core AT, and a lower average temperature results in a higher OT symbol omitted! T trip setpoint. However, if reactor power does not decrease at a sufficient rate, and symbol omitted! T exceeds the OT symbol omitted! T setpoint, a reactor trip occurs.

According to Section 4.1.5 of the PBNP Final Safety Analysis Report (FSAR), the turbine bypass and steam dump systems are designed to accept a step load decrease of up to 50 percent of full power without a reactor trip, or a turbine trip from below 50 percent power without a reactor trip. Since we believe this event involved a step load decrease of less than 50 percent, it would appear that a reactor trip should not have occurred. Therefore, the secondary system response during this event will be evaluated further.

CAUSE

The exact cause of the leaking union joint could not be determined. However, this union joint was disconnected when maintenance was performed on the EH system during the Fall 1994 Unit 2 refueling outage. Unit 2 operated since November 1994 without any identifiable leakage from this union joint. The EH system is inspected during each operating shift as part of the turbine hall operators routine rounds. The inspection of the EH system in the high pressure turbine enclosure which had occurred approximately 5 hours prior to the event revealed no abnormalities in the EH system.

CORRECTIVE ACTIONS

Immediate:

1. Operating personnel attempted to tighten the union joint and maintain level in the EH oil reservoir.

Short term:

1. After the turbine runback and reactor trip occurred, appropriate emergency operating procedures were entered and post-trip reviews were conducted.

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Long term:

1. The union joint was repaired with a new teflon seal. No abnormalities were observed when the EH control system was returned to service.
2. We will follow up with Westinghouse and review industry experience on similar events to try to determine the cause of the oil leak and identify further corrective actions if necessary to prevent recurrence.
3. We will review the expected/actual secondary plant response during this event and identify further corrective actions if necessary.

REPORTABILITY

This event is being reported in accordance with 10 CFR 50.73 (a) (2) (iv), "The licensee shall report ... any event or condition that resulted in a manual or automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS)." A 4-hour ENS notification was made in accordance with 10 CFR 50.72 (b) (2) (ii). The NRC Resident Inspector was also notified.

SAFETY ASSESSMENT

The reactor protection system functioned as designed during this event. The secondary plant responded more conservatively than expected as it caused the reactor trip to occur at less than a 50 percent step load reduction. The safety of the plant and the health and safety of the public and plant employees were not jeopardized.

GENERIC IMPLICATIONS

No generic implications have been identified.

SIMILAR OCCURRENCES

None

*** END OF DOCUMENT ***
